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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOHN NAGYVARY, PETER ALLEN ZAWADZKI, STEVE SEEL, and JAMES FORESI

Appeal 2015-007602
Application 12/553,813[1]
Technology Center 1700

Before CHRISTOPHER L. OGDEN, CHRISTOPHER C. KENNEDY, and DEBRA L. DENNETT, *Administrative Patent Judges*.

OGDEN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision[2] finally rejecting claims 1–18 in the above-identified application. We have jurisdiction pursuant to 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

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[1] Appellant identifies Suncore Photovoltaics, Inc. as the real party in interest. Appeal Br. 2, Jan. 26, 2015.

[2] Office Action, Aug. 22, 2014 [hereinafter Action]; Examiner's Answer, June 17, 2015 [hereinafter Answer].

BACKGROUND

Appellants' invention relates to an encapsulated "solar cell subassembly for use in a concentrator photovoltaic system." Spec. ¶ 2. An embodiment is depicted in Figure 4, reproduced below:

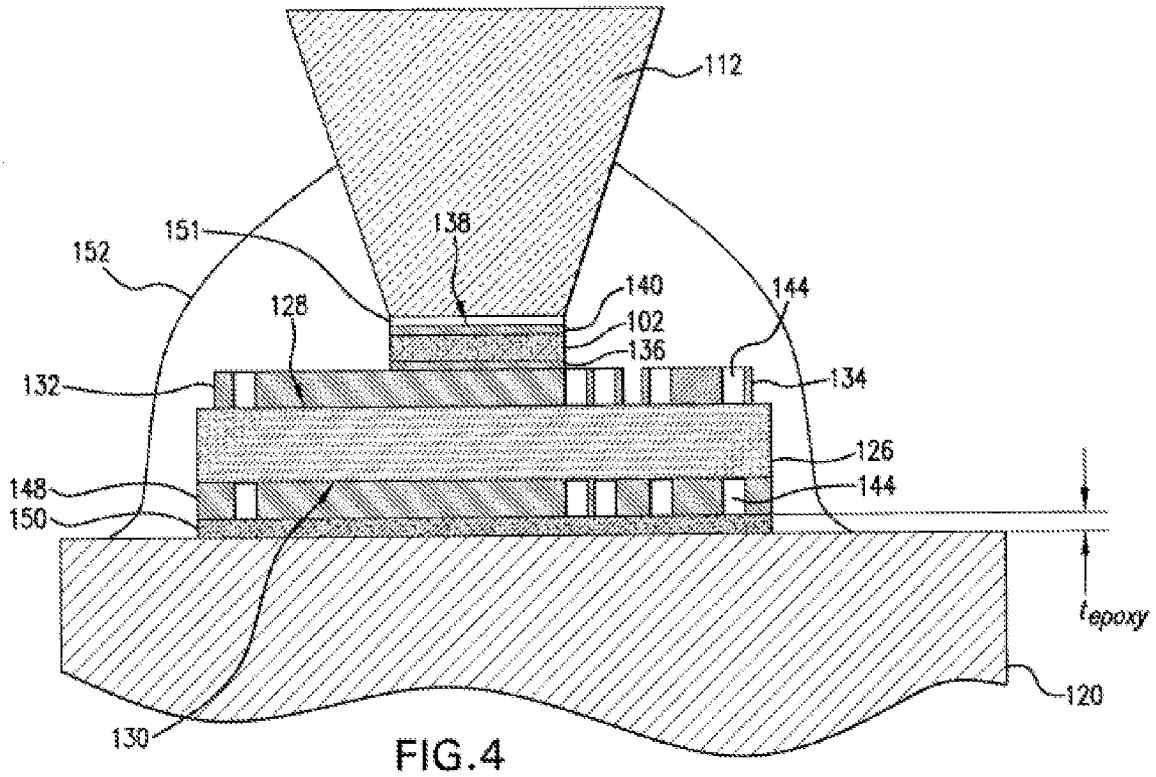

FIG.4

Figure 4 is a cross-sectional view of a subassembly, in which a solar cell **102** sits under the tapered body **112** of an optical element, and sits above a ceramic substrate **126**, which is also above a heat sink **120**. Spec. ¶¶ 20, 35. The substrate has a lower metallized surface **130**, and surrounding all of these components and the lower portion of the optical element is an encapsulant **152**. *See id.* ¶ 35.

Independent claim 1 is representative:

> 1. A solar cell receiver subassembly for use in a concentrating solar system which concentrates the solar energy onto a solar cell by a factor of 1000 or more for converting solar energy to electricity, comprising:

> a solar cell receiver comprising a support defining an upper surface facing an upper direction and a lower metallized surface facing a lower direction, wherein the lower direction is opposite the upper direction;
>
> a solar cell defining an upper surface facing the upper direction and a lower surface facing the lower direction, wherein the lower surface of the solar cell is mounted on the upper surface of the support, wherein the solar cell comprises one or more III-V compound semiconductor layers;
>
> an optical element defining an optical channel from an optical inlet to an optical outlet and configured to direct light toward the solar cell, wherein the optical element defines at least one exterior side surface extending between the optical inlet to the optical outlet, wherein the optical outlet is coupled to the upper surface of the solar cell; and
>
> *an encapsulant covering the support, the solar cell, and at least a portion of the at least one exterior side surface of the optical element to surround and encapsulate the solar cell and the support.*

Appeal Br. Claims App. 1 (emphasis added). Independent claim 11 is a manufacturing method containing similar limitations. *See id.* at 2–3.

The Examiner maintains the following grounds of rejection:

I. Claims 1–5, 8, 10–14, and 16–18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Todorof[3] in view of Shook.[4] *See* Action 2–7.

II. Claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Todorof in view of Shook and Pardell Vilella.[5] *See* Action 7–8.

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[3] Todorof et al., U.S. Patent No. 4,830,678 (issued May 16, 1989).
[4] Shook et al., Patent Application Pub. No. US 2009/0159122 A1 (published June 25, 2009).
[5] Pardell Vilella, Int'l Patent Publication No. WO 2006/114457 A1 (published Nov. 2, 2006).

III. Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Jensen in view of Todorof in view of Shook and Jansen.[6] *See* Action 8–9.

IV. Claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Todorof in view of Shook and Penumatcha.[7] *See* Action 9.

In the Appeal Brief, Appellants argue independent claims 1 and 11 as a first group, and claims 17 and 18 as a second group. *See* Appeal Br. 6–15. Appellants present no separate arguments regarding claims 2–10 and 12–16. See *id*. at 15–17. Therefore, consistent with 37 C.F.R. § 41.37(c)(1)(iv) (2016), we limit our discussion to claims 1 and 17, and all the other claims stand or fall with these claims.

DISCUSSION

Claims 1–16

The Examiner finds that Todorof discloses an assembly of components for a concentrating photovoltaic system that includes most of the limitations of claim 1. *See* Action 2–3. Figure 1 of Todorof is reproduced below:

[6] Jansen et al., U.S. Patent No. 6,077,722 (issued June 20, 2000).
[7] Penumatcha et al., Patent Application Pub. No. US 2007/0116414 A1 (published May 24, 2007).

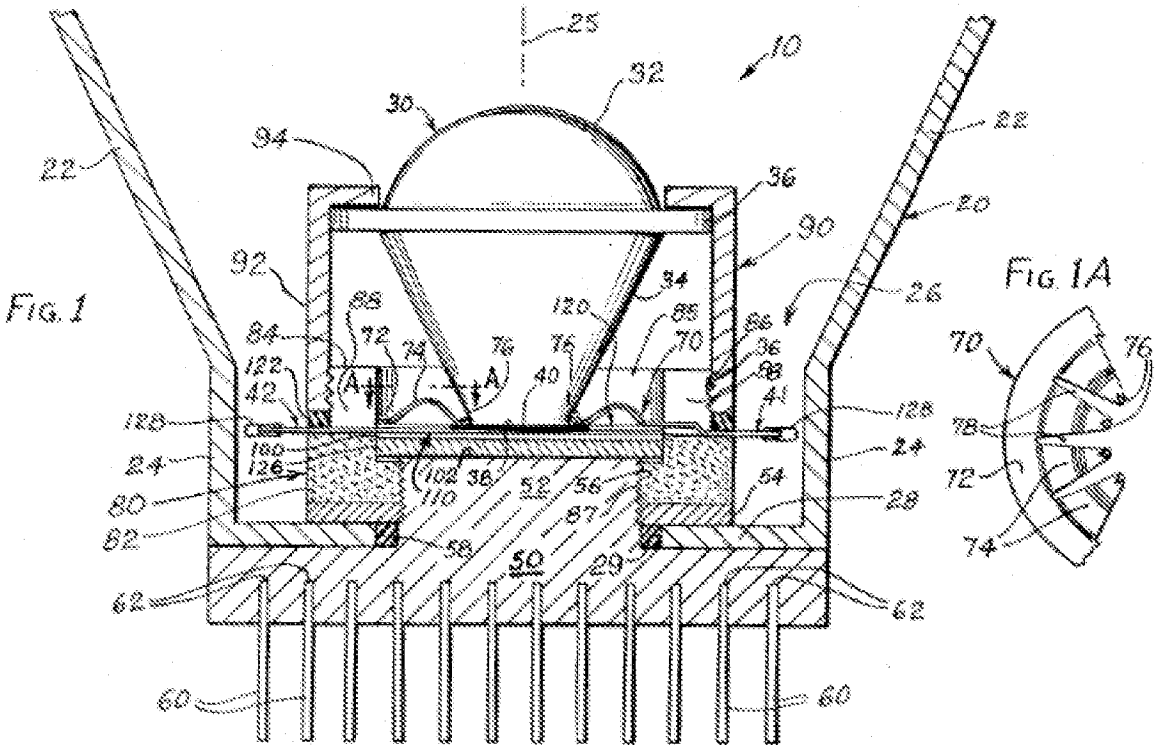

Figure 1 depicts a concentrating photovoltaic assembly including a tapered secondary lens **30** over a solar cell **40**. *See* Todorof 3:4–34. Below the solar cell is a rear terminal **110**, and below that is a thin insulating disk **100** and a heat sink **50**. *See id.* at 3:21–27, 6:10–15. The region between the solar cell and the heat sink is surrounded by a threaded base member **80**. *See id.* at 4:57–5:5.

Although Todorof does not teach an encapsulant as required by the final paragraph of claim 1, the Examiner finds that Shook discloses an encapsulant that covers a support, solar cell, and at least a portion of an exterior side surface of an optical element as required by claim 1. *See* Action 3–4. Figure 4B of Shook is reproduced below:

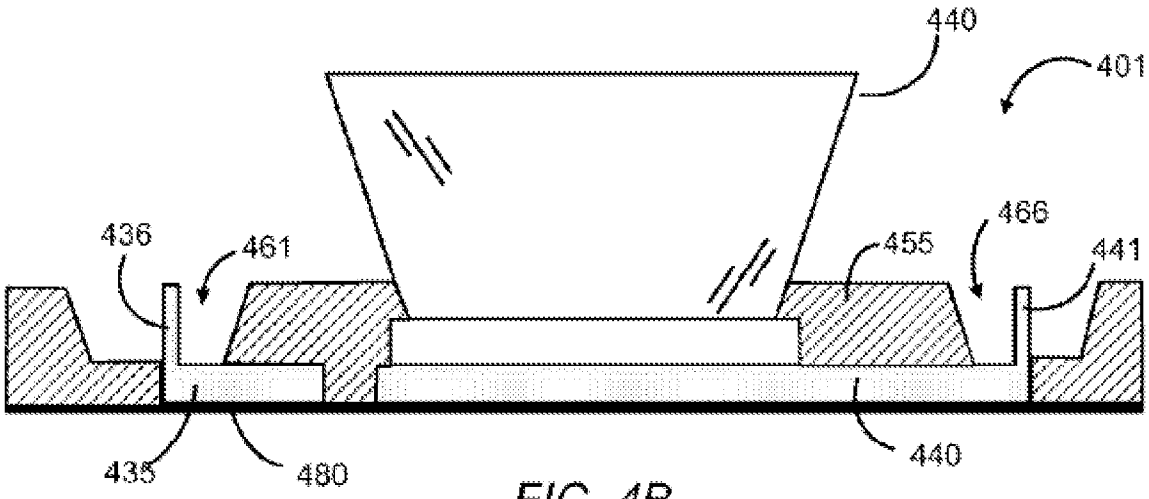

FIG. 4B

Figure 4B depicts a cutaway side view of an assembly including a tapered optical element **440** over a solar cell (rectangle directly below optical element **440**), over a conductive element **440** (bottom of figure). *See id.* ¶ 30. Surrounding the solar cell, the conductive element, and the lower portion of the optical element is a mold compound **455**. *See id.* According to Shook, the mold compound "may assist in the dispersion of heat from incident solar energy." *Id.* ¶ 21. The Examiner finds that "[a] molded compound like Shook's predictably would have helped prevent Todorof's cell from overheating, a problem recognized by Todorof." Action 4 (citing Todorov 1:22–25). Thus, the Examiner concludes that "in order to protect Todorof's cell from heat damage, it would have been obvious to one of ordinary skill in the art [to] incorporate into Todorof's device a molded compound like Shook's." *Id.*

Citing *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984), Appellants argue that modifying Todorof according to the teachings of Shook "would render the invention of Todorof et al. unsatisfactory for its intended purpose." Appeal Br. 6–7. According to Appellants, an express intended purpose of the Todorof invention is that the sealed enclosure 10 "can be disassembled

readily, if desired, for ease of cell replacement." *Id.* at 7 (citing Todorof 6:67–7:1) (emphasis omitted). Appellants argue that if the Todorof apparatus were encapsulated according to the teaching of Shook, the mold compound "would prevent the sealed enclosure of Todorof et al. from being disassembled readily for ease of solar cell replacement." *Id.* at 9 (emphasis omitted); *see also* Reply Br. 2–3. For similar reasons, Appellants argue that Todorof teaches away from the use of an encapsulant, because "the sealed enclosure of Todorof et al. needs to be free from encapsulant to allow disassembly, and thus, teaches away from anything, such as encapsulant, that would restrict, or prohibit, disassembly." *Id.* at 10–11.

Appellants' arguments do not persuade us that the Examiner reversibly erred in rejecting claim 1. *Gordon* held that a prior art blood filtering apparatus would not have been functional if it had been modified by turning it upside down. *See* 733 F.2d at 902. By contrast, the proposed modification of Todorof by adding an encapsulant would not have rendered the resulting apparatus inoperable. Although Todorof teaches that ready disassembly is a beneficial feature of the disclosed design, *see* Todorof 6:66–7:1, a lack of ready disassembly would not have made the apparatus inoperable for its intended use as a concentrating photovoltaic device.

Moreover, Todorof does not teach away from the use of an encapsulant as set forth in claim 1, because it does not criticize, discredit, or otherwise discourage that solution. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Given that heat dissipation was a known concern at the time of filing, *see* Todorof 1:22–25, a person of ordinary skill in the art would have had reason to improve heat dissipation through the use of an encapsulant, even if the resulting design were not as readily dissassembled.

See Winner Int'l Royalty Corp. v. Wang, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.").

For the above reasons, Appellants have not persuaded us that the Examiner reversibly erred in rejecting claim 1, and likewise, we are not persuaded of reversible error in the rejections of claims 2–16.

Claims 17, 18

Claim 17 depends from claim 1, and further requires "a heat sink coupled to the lower metalized surface of the support, wherein the encapsulant further covers a region between the lower metalized surface of the support and the heat sink." Appeal Br. Claims App. 4.

The Examiner finds that

> Todorof teaches a heat sink (50) mounted by intervening structures to the rear terminal (110), which is the lower metallized surface of the support. Were Todorof modified in view of Shook as proposed above, the molded encapsulant would overlie, or cover, a region between the rear terminal (110) and the heat sink (50).

Action 7. As Appellants correctly note, *see* Reply Br. 4–5, the region in Todorof's disclosed apparatus between the rear terminal 110 and the heat sink 50 is enclosed by base member 80, and it is unclear how Todorof would have been modified by a person of ordinary skill in the art such that the encapsulant further covers this region, without a significant redesign. It is not simply enough, as the Examiner suggests, *see* Appeal Br. 15, that the encapsulant "lie above that region" in the vertical plane. Based on the

ordinary meaning of the claims, and in light of the Specification, the broadest reasonable interpretation of the phrase *further covers* requires that the encapsulant have at least some degree of contact with a region between the lower metalized surface of the support and the heat sink.

For the above reasons, the Examiner reversibly erred in rejecting claim 17. For the same reasons, the Examiner erred in rejecting claim 18.

DECISION

The Examiner's decision to reject claims 1–16 is affirmed.

The Examiner's decision to reject claims 17 and 18 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended. *See* 37 C.F.R. § 1.136(a)(1)(iv) (2016).

AFFIRMED-IN-PART